

NAVAIR 16-45-716

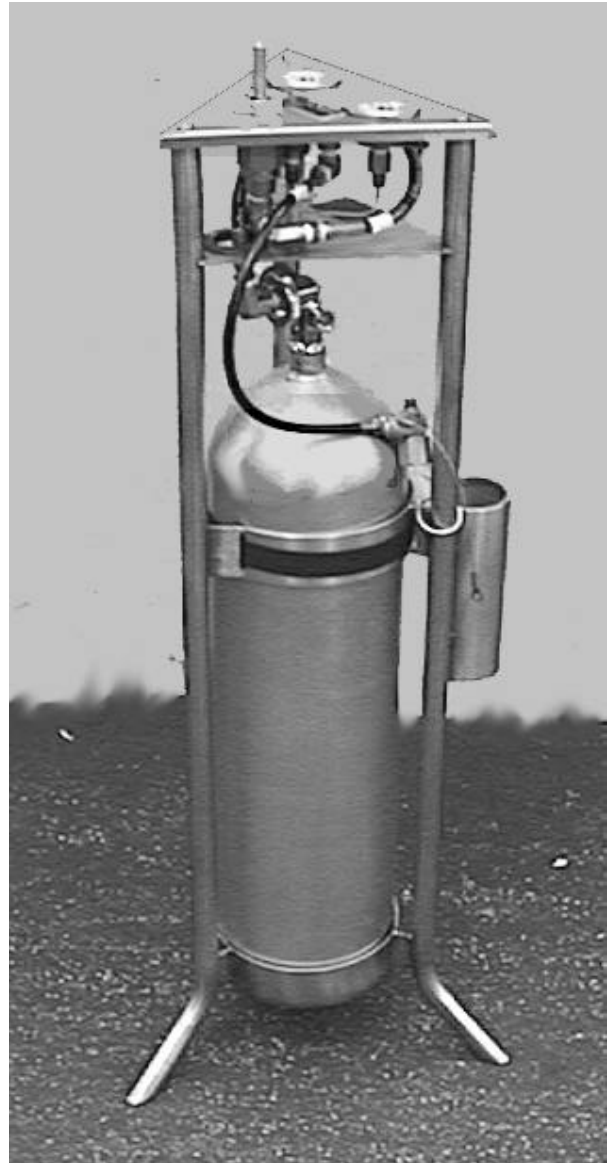
Portable Refill System (PRS)

for the

Helicopter Aircraft Breathing Device (HABD)

**This manual supercedes
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NOTE: The terminology in this manual refers both to the HEED, and to the HABD (HEED II).

PORTABLE REFILL SYSTEM (PRS) CQU-10/U
FOR THE HELICOPTER AIRCREW
BREATHING DEVICE (HABD)

Section 1. Description

1.1 GENERAL.

1.1.1 The CQU-10/U Portable Refill System (PRS) is a 120 cubic foot SCUBA cylinder with 3500 psi pressure designed to top-off or fill the new 3000 psi SRU-40/P Helicopter Aircrew Breathing Device (HABD) (Figure 1-1). The 3500 psi supply cylinder is mounted within a frame that provides protection, easier transportability, a blast tube, and a control panel for the unit. The control panel has a supply-pressure gauge to indicate the pressure existing in the supply tank and a fill-pressure gauge to indicate the pressure in the HABD being filled. The fill valve is a toggle-actuated knob to control the airflow from the PRS to the HABD. When it is full, the PRS should have enough air to fill about 10 HABDs.

1.1.2 The Naval Aviation Inventory Control Point, Philadelphia (NAVICP-Philadelphia) will stock the CQU-10/U under P/N 1586AS401-1 (CAGE 30003). The PRS is manufactured by Breathing Air Systems, a division of Sub-Aquatics, Inc. (CAGE 63054).

1.2 CONFIGURATION.

1.2.1 The CQU-10/U PRS is a self-contained system.

1.2.1.1 The framework (01) is manufactured from polished 316 Stainless Steel tubing and 12 gauge plate. The ends of all of the tubing have stainless steel plugs welded in place. The blast tube is welded securely in place opposite the opening used for inserting the supply cylinder.

1.2.1.2 The gauge panel (02) is constructed of polished 316 Stainless Steel sheet stock. It has the holes cut into it for the gauges, toggle fill valve and mounting to the frame.

1.2.1.3 The gauges (15) are identical, dry 2½ inch 5000 psi gauges with a ¼ inch male, national pipe thread (MNPT) center back connection and "U" clamp. These are standard commercial gauges with all oil removed from the connection and cleaned for breathing air use.

1.2.1.4 The supply hose (07) (PRS-5) that connects the gauge panel to the supply cylinder (21) is a 18¼ inch long piece of thermoplastic 5000 psi hose with a male 1/4" NPT fitting on both ends.

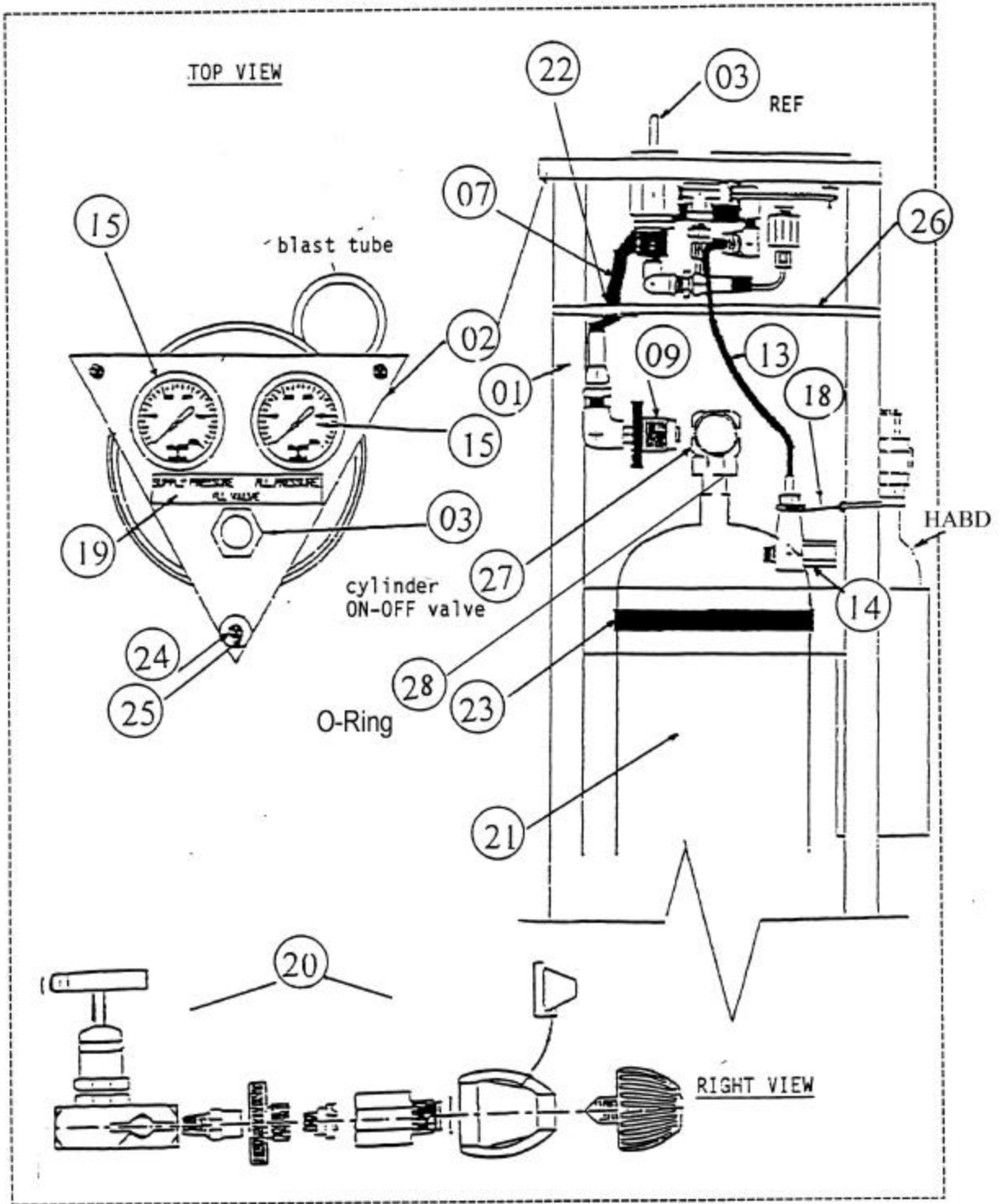


Figure 1-1. Portable Refill System (PRS) CQU-10/U

1.2.1.5 The connector (PRS-6) to the supply cylinder is a standard SCUBA 300 BAR DIN Fitting (09) named "handwheel." This is available from U.S. Divers (CAGE 94120) or Breathing Air Systems (CAGE 63054).

1.2.1.6 The toggle fill valve (03) (PRS-7) is a valve that is normally closed and opens any time the knob is moved from center. (It will spring back to closed position when the force is removed.)

1.2.1.7 All tubing on this system is 1/8" .035 wall seamless type 304 stainless steel tubing that has been cleaned to remove oil, grease and dirt.

1.2.1.8 The fill portion of the PRS consists of the stainless steel braid fill hose (13); i.e., the fill hose (PRS-9) and the top-off adapter (14) connector (PRS-21).

1.2.1.9 A stainless cable assembly (18) holds the fill hose (13) from flailing, should it become disconnected when charged.

1.2.1.10 A label (19) is on top of the gauge panel to indicate which is the supply pressure gauge, fill pressure gauge, and toggle fill valve.

1.2.1.11 Three washers (24) and screws (25) connect the gauge panel to the frame.

1.2.1.12 The supply cylinder (21) is held in place with a hook and pile strap (23).

1.2.1.13 The supply hose passes through the shelf below the gauge panel and a rubber grommet (22) prevents the hose from chafing.

1.2.1.14 A compressor adapter (20) comes with the PRS which is used to connect it with a compressor for recharging the PRS with air.

1.3 APPLICATION.

1.3.1 The PRS is designed to be used by the organizational maintenance level to top-off the HABD and by the intermediate level to top-off, purge and refill the HABD units. Also, the PRS is meant to be refilled itself by a compressor at the intermediate level of maintenance.

1.4 FUNCTION.

1.4.1 The CQU-10/U Portable Refill System is a 120 cubic foot supply cylinder pressurized to a maximum of 3500 psi used to top-off or fill HABD cylinders. The PRS should be able to fill 10 HABD units before having to be refilled itself by a compressor. The supply cylinder is encased in a frame for protection and transportability. The control panel has two gauges to indicate the pressure in the supply cylinder as well as the pressure in the HABD being

charged. Also on the control panel is a toggle fill valve, a switch which will release air from the supply cylinder to the HABD whenever it is pushed from its neutral position. Releasing pressure on the toggle fill switch will stop the flow of air.

1.5 REFERENCE NUMBER, ITEMS, AND SUPPLY DATA.

1.5.1 Section 8.0, Illustrated Parts Breakdown, contains information about the CQU-10/U PRS. It contains figure and index number, description, quantity per assembly and Source, Maintenance, and Recoverability (SM&R) codes for all components of the PRS.

Section 2. Modifications

2.1 GENERAL.

2.1.1 Modifications/Directives. Technical Directive Support Equipment Bulletin (SEB) 808, Basic and Amendment 1, apply. References: NAVAIRWARCENACDIVLKE MSG R 200755Z MAR 00 and NAVAIRWARCENACDIVLKE MSG R 16155Z MAY 00.

Section 3. Preparation for Use and Operation

3.1 PREPARATION FOR USE AND OPERATION.

- a. Preparing the PRS for Use. Open the carton that PRS is packed in. Carefully remove the items from the carton and lay them out. Visually check the items for obvious damage. Save the packing material for future use. The PRS is shipped with about 35 psi in the cylinder. It will need to be filled prior to use. To fill the PRS will require the use of an approved compressor capable of providing 3500 psi of dry, breathable air.

NOTE

Ensure that Supply Cylinder (P/N PRS-24-0786-97) is properly color coded IAW MIL-STD-101B. Cylinder should be painted black with green band, and white letters "AIR, COMPRESSED, BREATHING". Refer to Section 6.8.2.

- b. Replace the SCUBA fill fitting on the compressor fill line with the PRS-13 compressor adapter. This will allow filling of both standard SCUBA (with the yoke) and the PRS by removing the yoke and using the DIN connector handwheel. The compressor adapter has an inlet thread of ¼" female national pipe thread (FNPT). When attaching it to the compressor hose, Teflon tape or an approved sealant for high-pressure breathing air must be applied to the hose ¼ MNPT.

WARNING

High Pressure air is dangerous. Handle it carefully.

c. Screw the adapter into the valve of the cylinder, making sure it is snug. Open the cylinder valve, and fill the cylinder to 3500 psi. See Section 5 for filling instructions.

d. When the supply cylinder is full, turn valve OFF on compressor fill line; turn cylinder ON-OFF valve OFF (Figure 4-2), and open the in-line bleed valve off the compressor. Screw the handwheel into the cylinder valve and the PRS is now ready to use.

Section 4. Operating Instructions for Filling the HABD

4.1 OPERATING INSTRUCTIONS FOR THE PORTABLE REFILL SYSTEM (PRS) FOR THE HABD. This system is designed to safely refill the HABD unit to 3000 psi. When the supply cylinder is full, the PRS will completely refill 10 HABD units to 3000 psi.

NOTE

Refer to NAVAIR 13-1-6.5 for all HABD operations.

NOTE

Ensure that Supply Cylinder (P/N PRS-24-0786-97) is properly color coded IAW MIL-STD-101B. Cylinder should be painted black with green band, and white letters "AIR, COMPRESSED, BREATHING". Refer to Section 6.8.2.

a. Assure that the supply cylinder has at least 3100 psi. To do this, be sure the supply cylinder is connected. Turn the cylinder valve ON and check the pressure reading on the supply pressure gauge. If it is not at 3100 psi minimum, it will need to be refilled (See Cylinder Refill Instructions). (Figures 4-1 and 4-2).



Figure 4-1. Gauge Panel With Supply And Fill Pressure Gauge

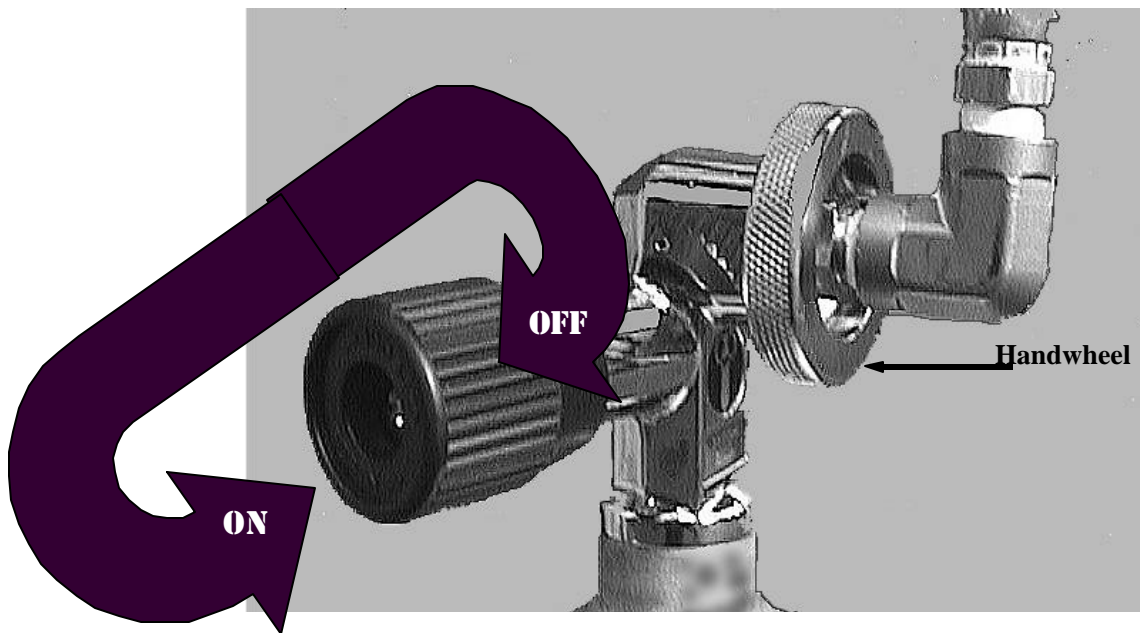


Figure 4-2. Supply Cylinder ON-OFF Valve

b. Inspect the PRS to assure that all of the hoses and o-rings are in good condition. Inspect the o-ring for the handwheel, which connects the PRS supply hose with the supply cylinder for nicks, tears and deterioration. (Figure 4-3). If a hose is damaged, it must be replaced prior to pressurizing the unit (see service instructions). Be sure to use the proper hoses when replacing them. Some hoses have oil in them which is not good for breathing air. Inspect all visible o-rings and if they are cut or damaged in any way, replace with proper o-ring.

WARNING

High pressure air can be dangerous. Handle it carefully!

NOTE

Be sure the cylinder has been hydrostatically tested within the last five years and visually inspected internally within the last year. A date of the former inspection will be stamped on the cylinder, and a tag should be attached to the cylinder to indicate date of the latter inspection.

c. Inspect the HADB for damage. If damage is found, it must be repaired before refilling the unit. Reference NAVAIR 13-1-6.5.

d. Be sure that the HABD unit is turned OFF. This is done by holding the first stage regulator and rotating the cylinder clockwise. (Figure 4-4).

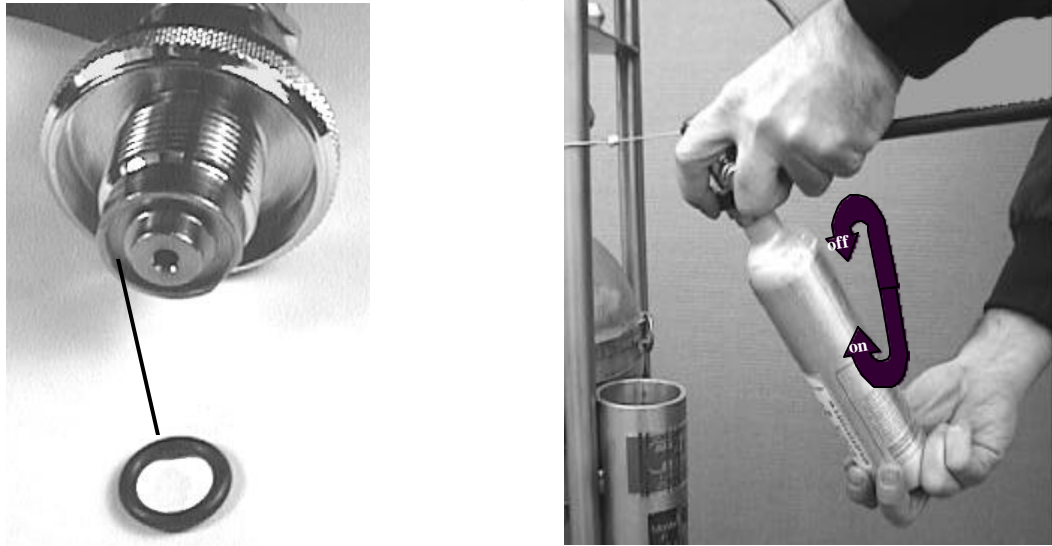


Figure 4-3. Handwheel Assembly O-Ring Figure 4-4. Rotating HABD ON-OFF

e. Purge the air from the HABD regulator by pushing on the purge cover opposite the mouthpiece.

f. Remove the dial gauge on the HABD by turning counterclockwise (right hand thread). A wrench may be used for this, if required.

g. Inspect the o-ring at the base of the gauge and replace if needed. (Refer to HABD manual.) Place the gauge in a safe place as it will be reinstalled when the HABD is full.

h. Inspect the o-ring at the base of the top-off adapter and replace if worn or damaged. (Figures 4-5 and 4-6).



Figure 4-5. Top-Off Adapter O-Ring



Figure 4-6. Top-Off Adapter

- i. Carefully screw the top-off adapter into the port from which the dial gauge was removed. The adapter should go in all of the way until the o-ring is seated between the adapter and the HABD. Use only finger pressure on the knob to achieve this; if this will not seat with finger pressure, remove it and clean the threads and repair them if needed. (Figure 4-7).
- j. Turn the HABD ON by holding the first stage regulator and rotating the cylinder counterclockwise.
- k. Place the HABD unit into the tubular holder blast tube provided on the PRS.
- l. Turn the supply cylinder ON using the valve on the cylinder. (This step may be done at the beginning of the process, and the cylinder left ON until all filling of HABDs is complete. Close this valve for storage.)



Figure 4-7. Connecting HABD to PRS Top-Off Adapter

CAUTION

Overfilling the HABD beyond 3000 psi could rupture HABD burst disc.

- m. To start the fill process, SLOWLY tilt the fill toggle knob on the control panel in any direction. (Figure 4-8.) The further you tilt it, the faster the air is transferred. These fills should be done slowly so that the cylinder does not receive the shock of the air all at once and so that the HABD unit does not heat up excessively (when it cools the pressure will drop and the unit will need to be refilled). Releasing the knob will stop the filling process. Increase the pressure in the HABD by about 500 psi and then allow the unit to stand for several minutes to cool, then repeat this until the HABD is full. **3000 PSI IS FULL!**

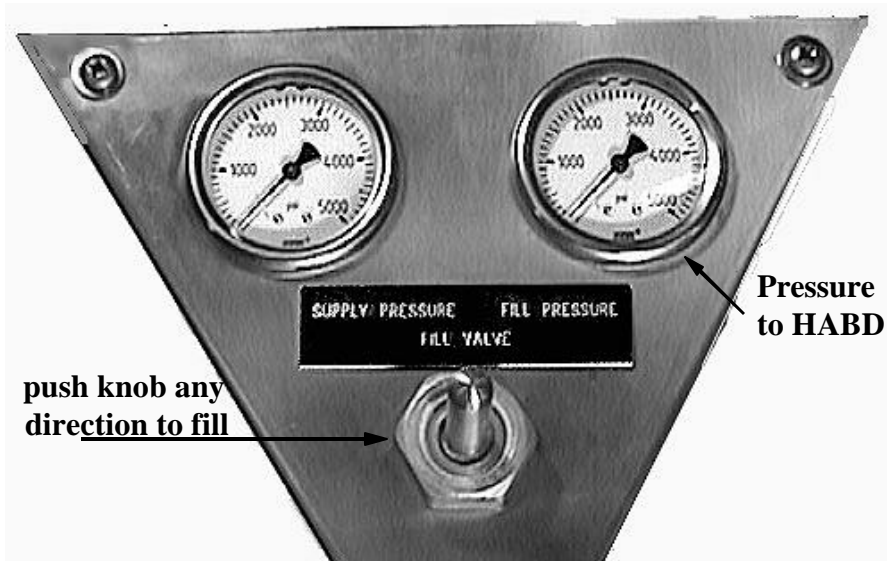


Figure 4-8. Control Panel

- n. When the HABD is full, turn HABD OFF by rotating the HABD cylinder clockwise. (Figure 4-4.) Always hold the first stage regulator when turning the HABD ON or OFF.
- o. Purge the air from the HABD regulator by pushing on the purge cover opposite the mouthpiece.
- p. Disconnect the top-off adapter by turning the knob on the adapter counterclockwise. (Figure 4-7.)
- q. Reinstall the dial gauge into the HABD unit.

Section 5. Filling the PRS

5.1 FILLING PRS WITH AIR COMPRESSOR.

WARNING

Only use authorized compressors that are capable of producing dry, breathing air to prevent air from contamination.

WARNING

Operations should be aborted at first indication of the presence of oil in the air being delivered to the PRS.

WARNING

Air discharged from the compressor must pass through a moisture separator and an approved filter to remove lubricant, aerosols, and particulate before it enters the Supply Cylinder. Any air compressor, if not permanently installed, must be firmly lashed in place. Most portable compressors are provided with lashing rings for this purpose.

5.2 Refilling the Portable Refill System Supply Cylinder.

Materials Required

<u>Component/Nomenclature</u>	<u>Part No./NIIN</u>
Lubricant, KRYTOX 240 AC Type III	MIL-G-27617/00-961-8995
Leak Test Compound	MIL-L-25567
Cloth, Lint Free	

Support Equipment Required

Air Compressor	UTILUS-10 (alternates VE-1, V3W)
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5.2.1 Refilling of the PRS supply cylinder shall be performed at Hevel. Supply cylinders are charged using approved operating procedures in the following manner:

NOTE

Ensure that Supply Cylinder (P/N PRS-24-0786-97) is properly color coded IAW MIL-STD-101B. Cylinder should be painted black with green band, and white letters "AIR, COMPRESSED, BREATHING". Refer to Section 6.8.2.

a. Check the supply pressure in the 3500 psi PRS, using the supply pressure gauge. If the pressure in the cylinder reads below 3000 psi, it will be necessary to recharge the cylinder. Verify that a hydrostatic test has been performed in the last five years by checking the last two digits stamped on the supply cylinder indicating the year so tested. Also, verify visual inspection tag is attached and up to date.

NOTE

Ensure all moisture is drained from compressor before beginning refill procedures.

- b. Turn the supply cylinder "ON-OFF" valve "OFF."
- c. Depressurize PRS supply hose by actuating toggle fill valve.
- d. Disconnect the supply cylinder by removing the handwheel (DIN) from cylinder valve inlet. Remove the cylinder from the frame by opening the hook and pile strap and lifting the cylinder out.
- e. Attach the compressor adapter less the yoke assembly (pressure in-line gauge, bleeder valve, in-line ON-OFF valve, and handwheel) to the compressor line, and then to supply cylinder valve inlet. Refer to Figure 5-1. Make sure that all fittings in the system are hand tight.
- f. Attach safety restraining line to supply cylinder charging lines.

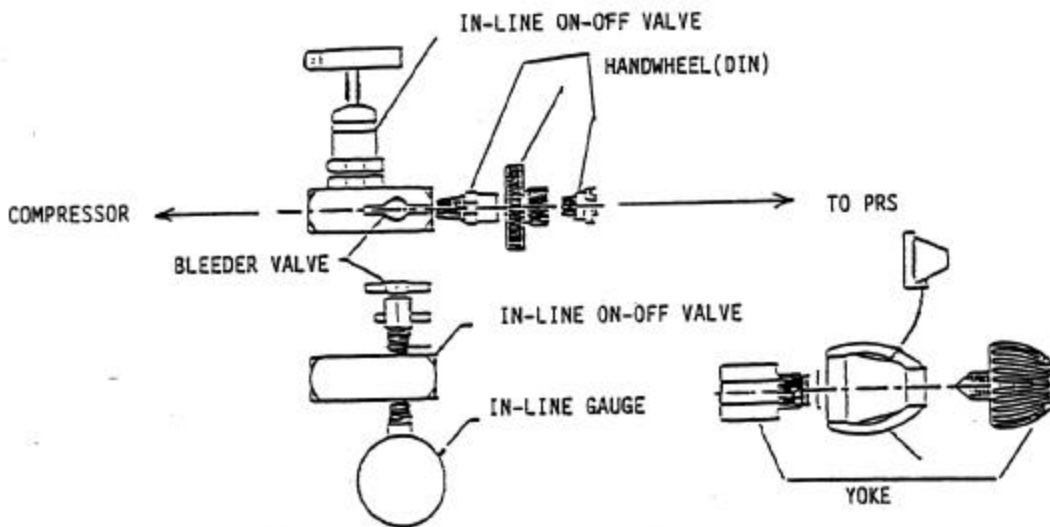


Figure 5-1. Connection of Compressor to PRS Supply Cylinder with Compressor Adapter

- g. Turn the supply cylinder "ON-OFF" valve "ON." Open the valve all the way, and then back-off 1/4 to 1/2 turn.
- h. Open in-line "ON-OFF" valve on the compressor line.
- i. Start compressor, and observe pressure readings on in-line pressure gauge. When the reading approaches the rated-pressure for the 3500 psi on the PRS, close the in-line "ON-OFF" valve on the compressor line. If not at 3500 psi, open valve and operate compressor until 3500 psi is achieved. Close in-line "ON-OFF" valve.
- j. Close the supply cylinder "ON-OFF" valve and turn the compressor "OFF."
- k. Vent the bleeder valve; then disconnect the compressor adapter from the PRS supply

cylinder.

l. If other supply cylinders require filling, repeat steps a through k. If filling is complete, go to step m.

m. Check to see that all valves in the system are firmly closed. Wait for the 3500 psi supply cylinder to cool to room temperature.

n. If the supply cylinders are to be stored or shipped, put protective caps over the cylinder valves. Caps should come with the cylinder; if they do not, they may be purchased at a local dive shop.

o. Return the supply cylinder to the PRS, and reconnect the handwheel connector to the supply cylinder. Ensure the hook and pile strap is secure. Open the supply cylinder "ON-OFF" valve and check the pressure for a minimum of 3500 psi, because when the cylinder has cooled, the pressure may have dropped. Turn supply cylinder "ON-OFF" valve "OFF" and depressurize the PRS supply hose by actuating the toggle-fill valve. The PRS is now ready to fill more HABDs.

Section 6. PRS Maintenance

6.1 PRS MAINTENANCE.

6.2 General. The PRS has three repairables; the toggle fill valve and the top-off adapter have an overhaul kit. The third repairable is the 3500 psi Supply Cylinder, which should be forwarded to the depot level or an authorized U.S. Diver's service facility for repairs.

Materials Required

<u>Quantity</u>	<u>Nomenclature</u>	<u>Reference Number</u>
As Required	Teflon Tape	
As Required	Cristo lube/KRYTOX	
1	Clean Cloth	
As Required	Silicone Lubricant (Dow Corning 111) (KRYTOX may be used as a substitute)	

Support Equipment Required

<u>Quantity</u>	<u>Description</u>	<u>Reference Number</u>
1	O-Ring Removal Tool (brass)	9440-22
1	Cylinder Inspection Light (low voltage)	
1	Cylinder Holding Fixture or Vise	Common tools
1	Allen Wrench, 6mm	" "

As Required	Combination Wrenches 7/16" thru 1 1/2" "	"	"
1	Adjustable Wrench, 12"	"	"
1	Small, Flat-Blade Screwdriver	"	"
1	Medium, Flat-Blade Screwdriver	"	"
1	Snap-Ring Pliers	"	"
1	Needle-nose Pliers	"	"
1	Bench Vise	"	"
1	Small Magnifying Glass	"	"
1	Mallet	"	"

WARNING

Be sure all pressure is removed from the system before attempting any service!

NOTE

The warranty for all parts is one year from initial issue of the PRS. Subsequently, all replacement parts have a 90-day warranty.

6.3 Preventive Maintenance.

6.3.1 Organizational Level. The O-level scheduled maintenance is limited to:

- inspecting for obvious damage, or in case of hook and pile strap, for wear.
- checking that the flow of air from the PRS is adequate.
- verifying the accuracy on gauges.
- sending PRS to I-level every 12 months for overhaul.

O-level unscheduled maintenance consists of trouble-shooting the cause of the problem and removing and replacing the toggle fill valve, the top-off adapter or the supply cylinder and forwarding the failed unit to H-level. If the above action or actions do not correct the problem, forward the PRS to I-level.

6.3.2 Intermediate Level. The H-level scheduled maintenance consists of:

- replacing o-rings on PRS-7, toggle fill valve, and PRS-21, top-off adapter.
- overhauling the PRS annually.
- testing the supply cylinder hydrostatically or forwarding it to depot level or an authorized U.S. Diver's (CAGE 94120) representative.
- inspecting the supply cylinder annually.
- checking supply pressure and fill pressure gauges for accuracy.

The overhaul of PRS consists of removing and replacing the poppet cartridge (PRS-7-1) and o-rings in addition to other parts - such as hoses - which may be found to be excessively cracked or worn upon inspection.

The toggle fill valve and top-off adapter each have an overhaul kit (Figures 6-2 and 6-5) which should be used to overhaul them during the annual overhaul. Inspect the cylinder in accordance with (IAW) paragraph 6.8.1.

6.4 Unscheduled Maintenance.

6.4.1 Unscheduled maintenance shall consist of trouble-shooting and fault location of failed items. Then the items shall be repaired, removed and replaced or forwarded to depot level maintenance IAW the maintenance concept and Source Maintenance and Recoverability Codes. See Numerical Index. Also, verify the accuracy of the supply pressure and fill gauges, if necessary. See below for servicing instructions.

6.5 Servicing the PRS. The framework is manufactured from polished 316 Stainless Steel tubing and 12 gauge plate. The ends of all of the tubing have stainless steel plugs welded in place. The blast tube is welded securely in place opposite the opening used for inserting the cylinder. All welds are done by using the heli-arc process and 316 stainless steel filler wire. The welds are polished to the same finish as the starting material. This framework is not available as a replacement part. The only service required for this part is routine cleaning. The gauge panel is constructed of polished 316 Stainless Steel sheet stock. It has the holes cut into it for the gauges, toggle fill valve and mounting. The edges meet in the corners, are bent 90° to the face, and are welded using the heli-arc process and 316 stainless steel filler wire. All welds are polished to the same finish as the starting material. All burrs are removed from edges. The only service required for this part is routine cleaning. This is not a normal replacement part. The gauges are identical, dry 2½ inch 5000 psi gauges with a ¼ inch male, national pipe thread (MNPT) center back connection and "U" clamp. These are standard commercial gauges with all oil removed from the connection. Gauges must read +/- 100 psi; if not, gauge must be replaced. Verify the accuracy of gauges.

- a. To replace the fill gauge of supply gauge PRS-3: Disconnect supply hose (1) from the supply cylinder. Remove the three machine screws (2) and washers (3) that hold the gauge panel to the frame. Remove gauge panel from unit. Turn the gauge panel upside down on your work surface, and disconnect the small tube (4) from the gauge fitting (5). (Figure 6-1).
- b. Remove the gauge from the panel by loosening the two screws (6) from clamp on the rear of the gauge.
- c. Secure the fitting (5) in a vise and remove the gauge from the fitting.

- d. To reinstall the gauge, apply a wrap of Teflon tape to the gauge threads (be careful to not allow this to lap below the bottom thread as this may damage the system) and install fitting (5) in gauge and install gauge in panel using two screws (6).
- e. Reattach panel to unit with three screws (2) and washers (3).
- f. Reconnect supply hose (1) to supply cylinder.

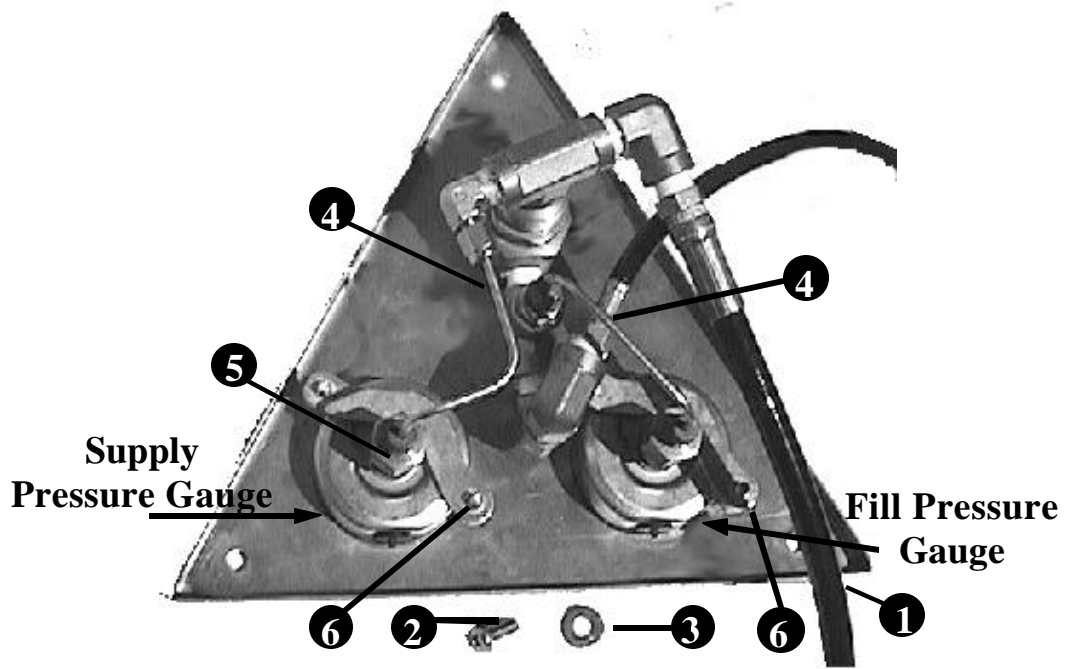


Figure 6-1. Underside of Gauge Panel

- g. All of the fittings on the gauge panel are commercially available fittings with a minimum 3500 psi working pressure. See the IPB for the descriptions of the fittings. Be sure that all oil, grease, dirt and rust are removed from all fittings prior to use. The only service required is to keep them clean and replace them, if damaged or leaking.
- h. The hose (1) that connects the fill panel to the supply cylinder is a 18¼ inch long piece of thermoplastic 5000 psi hose with a male ¼ inch NPT fitting on both ends. Be sure that only non-toxic lubricants are used if a hose assembly is made versus being ordered as a replacement. The only maintenance required is replacement when the hose shows

excessive wear or damage.

i. The connector (PRS-6) to the supply cylinder is a standard SCUBA 300 BAR DIN Fitting named "handwheel." This is available from U.S. Divers (CAGE 94120) or Breathing Air Systems (CAGE 63054). The typical service required on this will consist of replacing the o-ring at the seal to the cylinder valve. This is a standard commercial o-ring (Figure 2-3 for location).

j. The toggle fill valve (PRS-7) is a valve that is normally closed and opens any time the knob is moved from center. (It will spring back to closed position when the force is removed.) This valve will require annual filter changing by replacing the poppet cartridge (PRS-7-1), and maintenance only when it leaks or has restricted flow. To perform maintenance on this valve, first remove the gauge panel from the unit (see above for instruction on removing gauge panel from frame), then remove the tubes from the valve using an open-end wrench. Remove the large nut from the top of the valve (on the face of the panel). The valve will come out in your hands. After the valve is removed, it can be repaired or replaced. To repair the valve, see paragraph 6.6 on toggle fill valve repair. To replace the valve, transfer all fittings to the new valve.

NOTE

Be sure that all fittings are transferred into the new valve in the same orientation as they were in the old valve.

Use Teflon tape on all NPT connections being careful not to allow tape to lap over the bottom thread, as it can block the system.

k. All tubing on this system is 1/8 inch .035 wall seamless type 304 stainless steel tubing that has been cleaned to remove oil, grease and dirt. In the event that a tube needs to be replaced, use any tube that meets the above specifications and bend it to fit, and clean per NAVAIR06-30-501 section 3. Or order pre-made assemblies (see parts list for details). Be sure when working with tube and fittings that the ferrules are properly set (refer to fitting manufacturers directions) prior to pressurizing the assembly.

l. The fill assembly consists of the stainless steel, braided hose and the top-off adapter connector. The normal maintenance on this consists of replacing the o-ring on the connector end (when it shows wear), replacing the seals in the top-off adapter (when the swivel leaks air), and replacing the hose when it shows wear or damage. See section on top-off adapter (PRS-21).

6.6 Toggle Fill Valve (PRS-7). The toggle fill valve is an open or shut valve for air or gas lines up to 6000 psi. In the normal or relaxed position, the valve is shut, and the knob extends straight out. When the knob is tipped in any direction, the valve opens.

6.6.1 Installation. Use Teflon tape on inlet and outlet threads. Do not over-torque. Moderate torque applied with an 8 or 12 inch adjustable wrench is ample. Use ample Teflon tape - 3 or 4 turns (not 1 or 2 turns) on pipe threads. The inlet is the male thread and outlet is the female thread at the side of the valve.

6.6.2 Maintenance and Repair.

CAUTION

As with any regulator or valve, particulates or moisture can plug or freeze the internal filter or valve seat. This can occur when upstream dryers are not changed in the compressor, or remain unused for long period, which will allow corrosion materials to accumulate. The user should allow time for changing the poppet cartridge annually, and as necessary. Back-up systems should be used in very critical applications.

Using an 8 or 12 inch adjustable wrench, disconnect the toggle fill valve.

The poppet cartridge PRS-7-1 is a factory-assembled item and should be replaced, if required, but not disassembled.

- (a) Toggle Fill Valve (PRS-7). Use Dow 111 grease on o-rings and threads except for o-ring (PRS-7-12). Under extended or severe operations, life of the valve can be extended by repacking o-ring (PRS-7-12) and the areas between the toggle (PRS-7-6) and the toggle cap (PRS-7-5) with Dow 111 silicone grease, Cristo lube MCG121 (KRYTOX) or equivalent. The poppet cartridge (PRS-7-1) is a factory-assembled item that should be replaced by I-level, if required. In all cases the unit can be returned to the factory or dealer for repair under warranty.
- (b) The toggle fill valve consists of the parts listed in Figure 6-2 (See IPB Section 8) and requires annual overhaul at the intermediate level of maintenance. This overhaul consists of replacing the poppet cartridge, which includes a filter within it, and an o-ring (PRS-7-11). The kit also includes two additional o-rings (PRS-7-10 and PRS-7-12) that should be replaced whenever the poppet cartridge is replaced.

Material List

<u>Item No.</u>	<u>Part No.</u>	<u>Qty</u>	<u>Description</u>
1	PRS-7-1	1	Poppet Cartridge Assembly*
2	PRS-7-2	1	Body
3	PRS-7-3	1	Cap
4	PRS-7-4	1	Stem*
5	PRS-7-5	1	Toggle Cap
6	PRS-7-6	1	Toggle Knob
9	PRS-7-9	1	1" x 14, Jam Nut, PTL
10	PRS-7-10	1	2-018 Viton, 90 Duro O-Ring*
11	PRS-7-11	1	2-014 Viton, 90 Duro O-Ring*
12	PRS-7-12	1	2-006 Viton, 90 Duro O-Ring*
13	PRS-7-13	1	Spring C0300 038 0690S*

- Items in PRS-7-14 Toggle Fill Valve Overhaul Kit. Also included in PRS 7-14 is the Toggle Fill Valve Overhaul Kit.

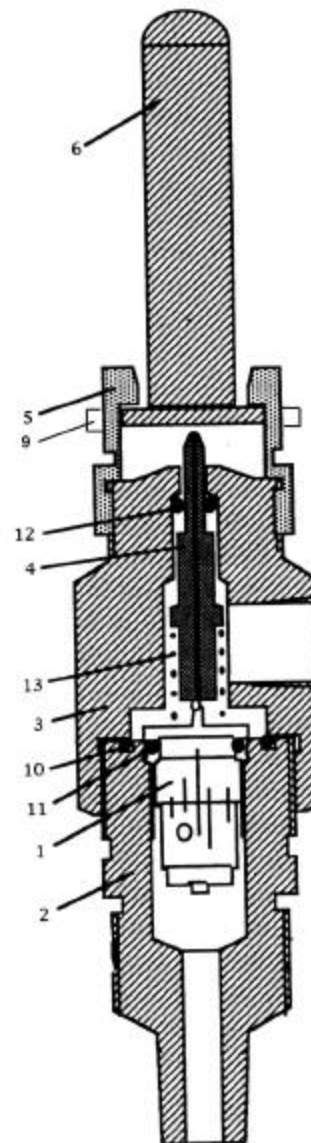
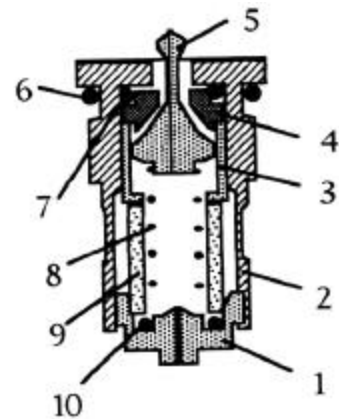


Figure 6-2. PRS-7 Toggle Fill Valve Schematic

Material List

<u>Item No.</u>	<u>Qty</u>	<u>Description</u>
1	1	Retainer Nut
2	1	Poppet Housing
3	1	Sleeve
4	1	Seat
5	1	Poppet
6	1	2-014 o-ring (PRS-7-11)
7	1	2-009 o-ring
8	1	spring
9	1	filter
10	1	2-008 o-ring



NOTE

The poppet cartridge is a remove and replace item. Figure provided for reference only.!

Figure 6-3. PRS-7-1 Poppet Cartridge Schematic

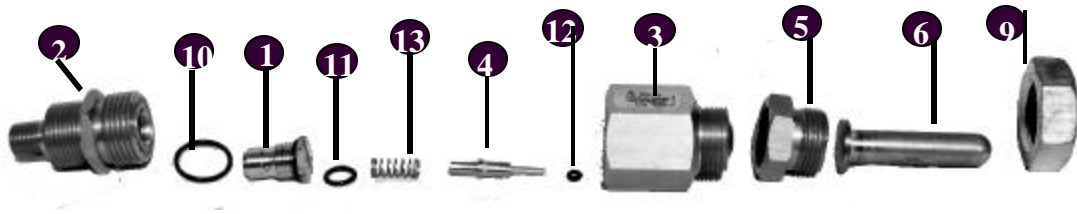


Figure 6-4. PRS-7 Toggle Fill Valve

6.7 Top-off Adapter (PRS-21). The top-off adapter is used as the connector between the HABD and the PRS. It is a durable item that requires little maintenance. Routine maintenance is described below. Other maintenance is required only when the adapter is hard to turn or has developed a leak. See Figure 6-5 for item breakdown and parts that make-up the top-off adapter.

Material List

<u>Item No.</u>	<u>Part No.</u>	<u>Qty</u>	<u>Description</u>
1	PRS-21-1	1	Sleeve and Knob Assembly
2	PRS-21-2	2	Back-Up Ring*
3	PRS-21-3	2	O-Ring*
4	PRS-21-4	1	Casing
5	PRS-21-5	1	Snap Ring SS*
6	PRS-21-6	1	O-Ring*

*Items in PRS-21-7 Top-Off Adapter Overhaul Kit

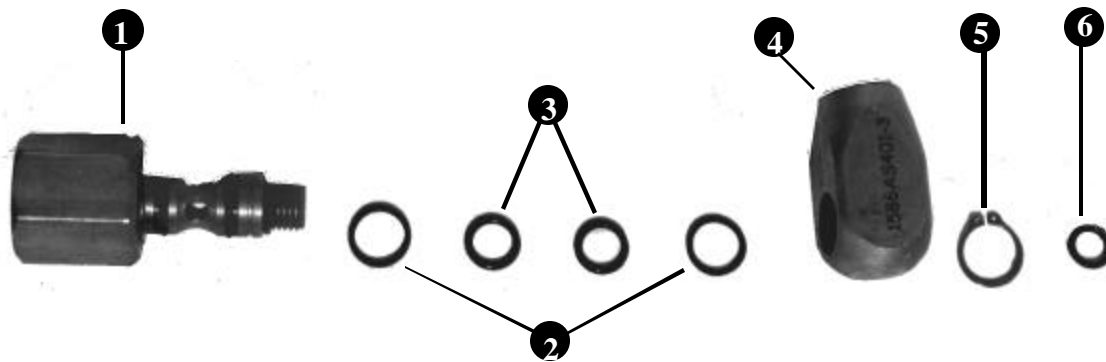


Figure 6-5. PRS-21 Top-Off Adapter

6.7.1 Installation. Installation simply involves screwing the PRS fill hose into the top-off adapter and screwing the top-off adapter into the HABD.

6.7.2 Maintenance and Repair. The only routine replacement item is the o-ring (part number PRS-21-6) that seals the connection of the PRS-21 to the HABD.

6.7.3 To disassemble the PRS-21 Top-Off Adapter (only required if the unit leaks at the swivel):

- a. Remove the snap ring (PRS-21-5) by using a set of external snap ring pliers.
- b. Remove sleeve (PRS-21-1) from casing (PRS-21-4) by holding the casing and pulling the sleeve. If required, the sleeve can be grasped with a set of locking pliers or in a vise. It may help to rotate the casing while removing the sleeve.

- c. Inspect the casing internally for scoring, dirt or corrosion. Clean any dirt from the internal surfaces. Replace the entire adapter (PRS-21) if scoring or corrosion is found on internal surfaces.
- d. Clean all dirt and lubricant from the sleeve and inspect for wear and damage.
- e. Remove the back-up rings (PRS-21-2). These are rubber rings and can be removed by using an o-ring tool and lifting them from the groove and slipping them off of the sleeve. These items are normally replaced when this assembly is repaired.
- f. Remove the o-rings (PRS-21-3) from the sleeve by using an o-ring tool to lift them from the grooves and to slip them off of the end. Use care so that you do not scratch the sealing surface of the sleeve behind these o-rings. Clean dirt and old lubricant from o-ring grooves.
- g. Assemble in reverse order. Use a non-toxic o-ring lubricant (i.e. KRYTOX) on the back-up rings and o-rings.

6.8 Supply Cylinder. The 3500 psi supply cylinder should be either removed and replaced, or sent to depot level or an authorized U.S. Diver's representative for repair (CAGE 94120).

WARNING

This cylinder has a maximum service pressure of 3500 psi. Under no circumstances should it be filled to a pressure greater than that. Failure to HABD this warning may result in serious injury or death.

6.8.1 Inspecting the Cylinder.

NOTE

Ensure that Supply Cylinder (P/N PRS-24-0786-97) is properly color coded IAW MIL-STD-101B. Cylinder should be painted black with green band, and white letters "AIR, COMPRESSED, BREATHING". Refer to Section 6.8.2.

- a. Remove the supply cylinder from the PRS by closing the cylinder valve (PRS-28), bleeding the pressure from the tubing by holding the HABD top off adapter and operating the toggle fill valve; then disconnect the handwheel from the cylinder by rotating it

counterclockwise until it is loose, open the strap's hook and pile (Velcro) fasteners and lift the cylinder out.

b. Wipe any dirt off of the outside of the cylinder using a clean cloth (soap and water if needed) and inspect the cylinder for external damage (cuts, dents, gouges, bulges, corrosion, bubbling of the galvanizing, abrasions or other damage. If damage is found, send it to an authorized depot rework facility or U.S. Divers representative (94120).

CAUTION

Protect the Cylinder from damage in the Clamping Fixture!

c. Place the cylinder in a vise or other clamping fixture.

WARNING

Eye and ear protection should be used when releasing the compressed air!

d. Depressurize the cylinder. This must be done slowly by opening the cylinder ON-OFF valve (P/N PRS-28) so that a small stream of air escapes from the valve. Once the pressure is released from the cylinder, open the valve fully.

WARNING

Failure to have the pressure released before proceeding may result in injury or death!

e. Remove the ON-OFF valve (P/N PRS-28) from the top of the cylinder. The valve should turn freely in the cylinder once the initial torque is released. If the valve does not turn freely after it has been loosened 1/4 turn, stop and make sure that all pressure is released from the cylinder. Proceed only after you are sure that all pressure is released from the cylinder!

f. Examine for damage and wipe clean with a dry cloth.

g. Remove the O-ring (P/N PRS-29) from the base of the valve and replace it with a new one.

h. Lubricate the valve threads and o-ring with silicone lube (Dow Corning 111 is preferred) or Krytox. Set the valve aside.

i. Wipe any dirt away from the opening of the cylinder. Insert a light into the cylinder that is bright enough to illuminate the complete interior. Look into the opening to see if the cylinder is clean, dry and free of detrimental corrosion.

NOTE

Over a period of time a reddish rust bloom may appear on the inside of the cylinder. This is not considered harmful unless the inspector determines that the rust is hiding pits or gouges. The rust must be removed if it is causing damage to the cylinder or if it is causing dust to enter the supply cylinder valve. The rust may be removed by a wire brush operated with a drill motor or by tumbling the cylinder. After the rust is removed, the cylinder must be flushed with fresh water and dried.

j. After the cylinder is cleaned and dried, it must be re-inspected to assure that the cylinder is clean dry and free from pitting. Refer to the CGA C-6-1984 for details on what level of pitting would be acceptable.

k. When it is determined that the cylinder is acceptable to return to service, remove the light and re-insert the valve by turning it clockwise until the shoulder of the valve is against the neck of the tank. This should require no more than hand pressure-if it does then the threads are damaged or dirty. Clean and examine the threads for damage. If damaged, repair or replace the damaged part and insert the valve again. When the valve is inserted by hand with the shoulder of the valve against the neck of the cylinder, use the large adjustable wrench on the flat area of the valve to tighten the valve (just enough so that it cannot be turned by hand).

l. After the cylinder inspection is complete, attach a tag to the cylinder to indicate the date that it was inspected and re-install the unit into the PRS frame; fill the cylinder to 3500 psi with an approved air compressor, and connect the cylinder back to the PRS.

6.8.2 Color Code For Supply Cylinder

a. Aircrew Survival Equipmentman: Supply Cylinder (P/N PRS-24-0786-97) which is supplied with the Portable Refill System (P/N 1586AS401-1, NSN 1R 220-01-446-2132) shall be painted IAW MIL -STD-101B to identify it as a breathable air cylinder.

b. Cylinder body shall be painted black with a 2 inch wide green band located approximately 6 inches from top of cylinder. Body of cylinder shall be stenciled with 2-inch high white letters AIR, COMPRESSED, BREATHING”.

c. If these markings are not present, forward unit to AIMD Work Center 51A with a requisition for painting.

8.8.2.1 Detailed Painting Instructions

AIMD Work Center 51A proceed with following steps:

a. Requisition material required through normal supply channels. Select paint which complies with local regulations.

1) Preferred coatings:

Primer: MIL -P-53022, TYPE II Polyamide Epoxy

Topcoat: MIL -PRF-85285, TYPE II Polyurethane

2) Alternate coatings

Primer: MIL -P-53030 Waterborne Epoxy

Topcoat: MIL -C-22750E, TYPE I (lead free) Polyamide Epoxy

b. Aviation Structural Mechanic: Clean area to be painted. Remove all grease, dirt, etc., and apply primer. Allow primer to dry.

c. Paint supply cylinder black, color NR 17038, IAW FED-STD-596. Allow paint to dry.

d. Paint 2 inch wide band approximately 6 inches from top of cylinder. Paint band green, color NR 14187. IAW FED-STD-595.

e. Stencil with following info; "AIR, COMPRESSED, BREATHING". Stencil IAW MIL -STD-101B, page 15, para 5.2.2 Paint for stencil shall be white, color NR 17875, IAW FED-STD-595. Letters shall be 2 inches high.

f. When paint has dried return unit to service use.

g. Complete VIDS/MAF form OPNAV 4790/60 IAW OPNAVINST 4790.2G. Log compliance in appropriate log/service record.

6.9 Handwheel Assembly (PRS-6) (DIN x 1/4 MNPT). The handwheel assembly is used as the connector between the PRS and the supply cylinder. (The exact same DIN is also part of the compressor adapter that is used to connect the compressor to the PRS). This part should be removed and replaced if damaged; however, the o-ring (PRS-6-1) may be replaced, if necessary. (Figure 6-6).

6.10 Compressor Adapter. The compressor adaptor is not a repairable part; however, the o-ring may be replaced. It is exactly the same as the o-ring discussed for the handwheel assembly above.

This adapter is designed to be connected to the compressor line. The yoke portion on the right (Figure 6-7) is meant to be used for the SCUBA cylinders currently being used to fill the 1800 psi SRU-36/P HABD. To use it to fill the PRS, the yoke must be unscrewed such

that the handwheel or DIN portion can be screwed directly into the PRS supply cylinder.

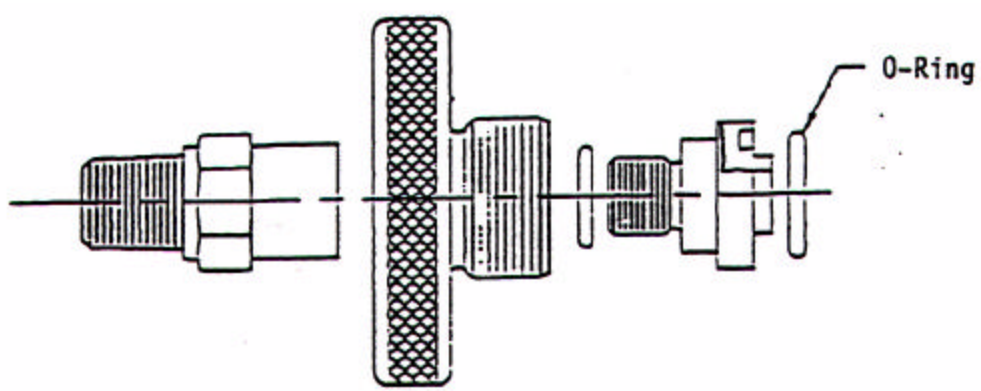
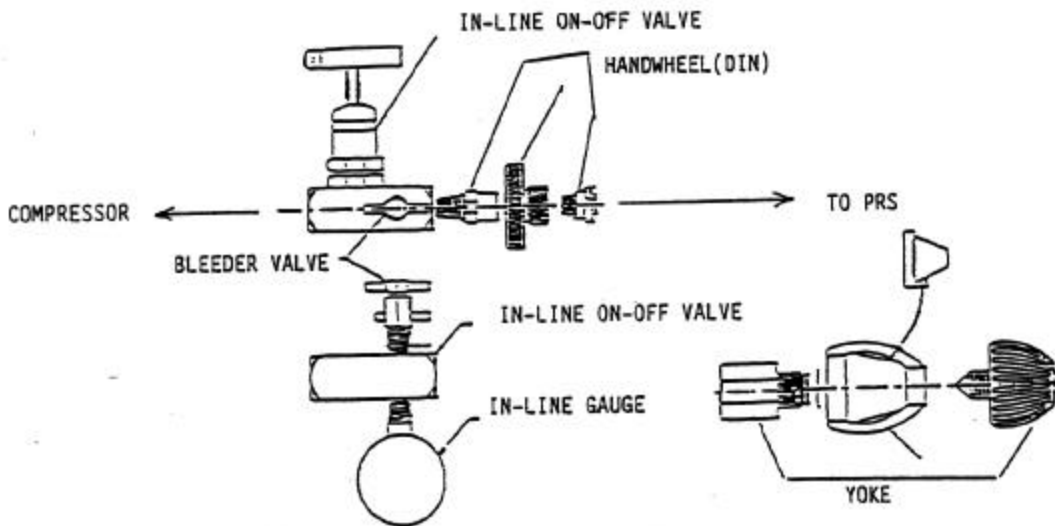


Figure 6-6. Handwheel Assembly



NOTE

The yoke portion of the Compressor Adapter is not used. Use only Handwheel, In-Line Valve and Gauge, and Bleeder Valve.

Figure 6-7. Compressor Adapter

Section 7. Storage and Preparation for Shipment

7.1 STORAGE AND SHIPMENT.

7.1.1 Storage. For short-term storage, store filled supply cylinders in a cool, shaded area (between 0°F and a maximum of 120°F). Never leave them in direct sunlight! Cylinder should always be secured to prevent them from falling over; this is particularly important aboard ship. Optimally, the PRS should be stored in an area covered from the weather and should have a fabric cover to protect the gauges and to prevent dirt from building up on PRS components.

7.1.2 PRS Transportation. The PRS can be transported by hand in a ready-to-use condition with no preparation, but the PRS should be secured if not hand-carried to prevent movement and possible damage. If the unit is to be shipped or stored for a period of time over 60 days:

WARNING

Hearing protection is required for all in the area. A cloth wrap will reduce the noise but may not bring it within acceptable limits

- a. Vent air from the supply cylinder until it has about 100 psi showing on the supply pressure gauge. To do this, wrap the top-off adapter in a clean dry cloth and hold it firmly. Then tilt the toggle fill valve knob slightly and allow air to escape slowly.
- b. Drop the pressure in the cylinder slowly in steps of about 500 psi (or less). Rapid venting of the air may cause moisture condensation to form inside of the cylinder necessitating the need to clean and dry the cylinder internally.
- c. When the cylinder has about 100 psi in it, close the cylinder valve and tilt the toggle valve to release the pressure in the lines.
- d. Cover the PRS to protect from the environment and secure as with any high-pressure air cylinder when not in use.

7.1.3 Preparation for Shipment. When shipping or storing the PRS, the ideal container is the box in which it was shipped. To pack the unit:

- a. Place the pan-shaped piece of cardboard in against the pad.
- b. Place the cardboard with the triangle cutout over the control panel of the PRS

- c. Hold the foam pad over the triangle cutout and lay the PRS into the box.
- d. Secure the box by closing the flaps and taping or banding.

CAUTION

If the pressure is not vented from the PRS to below 100 PSI, it must be marked (placarded) as "nonflammable compressed gas."

Section 8. Illustrated Parts Breakdown (IPB)

8.1 GENERAL.

8.1.1 This section lists and illustrates the procurable parts of the Portable Refill System (PRS).

8.1.2 The IPB is intended for use in the identification, procurement, storing, and issuing of replacement parts. It also illustrates disassembly and assembly relationships. Installation, operation, and maintenance of these devices shall be performed only by authorized personnel using the instructions in the preceding sections.

8.1.3 Figure and Index Number Column. The figure and index number of each item shown on the corresponding illustration appears in the Figure and Index number column. In this column, the digits preceding the dash refer to the figure in which the parts or assemblies are illustrated. The digits following the dash are the index numbers.

8.1.4 Part Number Column. This column contains the part numbers of the parts and assemblies. It may also contain drawing numbers and national stock numbers.

8.1.5 Indentation. The indentations headed "1" through "4" in the Description Column are provided to show the relationship of assemblies and their detail parts. The detail parts are indented one space to the right and listed below the assembly to which they belong.

8.1.6 Units Per Assembly Column. This column shows the quantity of an item required in the next higher assembly. The abbreviation REF indicates it is the reference or end-item to which all other parts correspond.

8.1.7 Usable on Code Column. Usable on Codes are used to indicate part usage where various models and serial numbers of the equipment or similar parts within the equipment use different parts.

8.1.8 Numerical Index. The numerical index contains all the part numbers arranged in alphabetical-numerical sequence.

8.1.9 Source, Maintenance, and Recoverability (SM&R) Code Column. The five digit SM&R codes, assigned by Naval Air Systems Command Representatives are reflected in the Numerical Index in the SM&R code column. The code format is composed of three parts consisting of a two-position Source Code, a two-position Maintenance Code, and a one-position Recoverability Code.

NOTE

For more complete information on Uniform SM&R Codes, refer to NAVSUPINST 4423.14 (current issue) and NAVAIRINST 4423.11 (current issue).

ILLUSTRATED PARTS BREAKDOWN

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable on Code
		1 2 3 4		
8-1	PRS 1586AS401-1	Portable Refill System (CAGE 63054)@	REF	
-01	PRS-1	· Control Panel and Frame	1	
-02	PRS-1-1	· · Control Panel, Bare	1	
-20	PRS-13 0541-65	· Compressor Adapter (94120)	1	
-21	PRS-24 0786-97	· 3500 psi 120 cu. ft. Supply Cylinder (94120)	1	
-22	PRS-17 5325-01-420-1693	· Grommet, Rubber	1	
-23	PRS-20	· Hook and Pile Strap	1	
-24	PRS-1-2	· 3/8 in. dia. 316 SS Washer	3	
-25	PRS-1-3	· 1/4 in. 20 x 3/4 in. LG Machine Screw	3	
-26	PRS-26	· Label, (manufacturer info.)	1	
-27	PRS-28	· Cylinder ON-OFF Valve	1	
-28	PRS-29	· O-ring	1	
8-2	PRS-27 1586AS401-2	· PRS (less items above) but includes PRS-1-1	1	
8-2-03 8-3	PRS-7 1586AS401-4	· · Toggle Fill Valve (63054) (OPH81) Note: # indicates parts that come in PRS-7-14, Toggle Fill Valve Overhaul Kit	1	
8-3-1	PRS-7-1#	· · · Poppet Cartridge Assy	1	
-2	PRS-7-2	· · · Body, Toggle Fill Valve	1	

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable on Code
		1 2 3 4		
-3	PRS-7-3	. . . Cap	1	
-4	PRS-7-4	. . . Stem	1	
-5	PRS-7-5	. . . Toggle Cap	1	
-6	PRS-7-6	. . . Toggle Knob	1	
-9	PRS-7-9 MS 35691-76	. . . 1.00-14 UNC-2B Jam Nut	1	
-10	PRS-7-10# 5330-00-166-0994	. . . 2-018 Viton, 90 Duro O-Ring	1	
-11	PRS-7-11# 5330-00-166-0990	. . . 2-014 Viton, 90 Duro O-Ring	1	
-12	PRS-7-12# 5330-00-166-0963	. . . 2-006 Viton, 90 Duro O-Ring	1	
-13	PRS-7-13	. . . Spring C0300 038 06908	1	
8-2-14 8-4	PRS-21 1586AS401-3	. . Top-Off Adapter, #4 SAE x 1/4 FNP Note: * indicates parts that come in PRS-21-7, Toggle Fill Valve Overhaul Kit	1	
8-4-1	PRS-21-1	. . . Sleeve Knob Assy	1	
8-4-2	PRS-21-2* 013 BUNA N	. . . Back-up Ring	2	
8-4-3	PRS-21-3* 2-013-70	. . . O-Ring (25204)	2	
8-4-4	PRS-21-4	. . . Casing	1	
8-4-5	PRS-21-5*	. . . Snap Ring	1	
8-4-6	PRS-21-6* 2-012-90 5330-00-166-0980	. . . O-Ring	1	

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable on Code
		1 2 3 4		
8-2-04	PRS-14 4730-01-268-2402	. . Tee, 1/4 FNPT, Brass	1	
-05	PRS-8 4730-00-163-4641	. . Elbow, 1/4 MNPT x 1/8 Tube	1	
-06	PRS-15 4730-00-278-4824	. . Elbow, Street, 1/4, Brass	3	
-07	PRS-5	. . Hose, Supply, 1/4 NPT, Brass Ends, 18 1/4 OAL	1	
-08	PRS-25 4730-00-841-7758	. . Elbow, Female, Brass	1	
-09	PRS-6	. . Handwheel Assy, DIN x 1/4 MNPT	1	
-09A	PRS-6-1 3-094/5330-00-166-1059	. . . O-Ring	1	
-10	PRS-16 4730-01-268-2403	. . Tee, Street, 1/4 Brass (63054)	1	
-11	PRS-2	. . Connector, 1/4 MNPT x 1/8 Tube, Stainless	1	
-12	PRS-12	. . Tubing, Fill, For PRS, 1/8 in. DIA., .028 Wall, 304SS	1	
-13	PRS-9	. . Hose, Fill, 1/4 MNPT SS Ends, 18 in. OAL	1	
-15	PRS-3 212.53,SS	. . Gauge, 2.5 in., Dry, 5000 psi, 1/4 CBM (1M203)	2	
-16	PRS-10 4730-00-161-7604	. . Connector, 1/8 in. Tube x 1/4 in. FNPT, Stainless	2	
-17	PRS-11	. . Tubing, Supply for PRS, 1/8 DIA., .028 Wall, 304SS	1	

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable on Code
		1 2 3 4		
8-1 18	PRS-18	. . Cable Assy, Stainless	1	
8-1-19	PRS-19	. . Label (for Supply Pressure Gauge, Fill Pressure Gauge and Toggle Fill Valve)	1	

@ All Part Numbers with "PRS" are available from CAGE 63054. Alternate CAGE numbers are provided in parenthesis where applicable.

Part of PRS-7-14, Toggle Fill Valve Overhaul Kit

8-3	PRS 7-14	. Toggle Fill Valve Overhaul Kit	1	
-1	PRS 7-14-1	. . Poppet Cartridge Assy	1	
-10	PRS 7-14-10	. . 2-018 Viton, 90 Duro O-Ring	1	
-11	PRS-7-14-11	. . 2-014 Viton, 90 Duro O-Ring	1	
-12	PRS 7-14-12	. . 2-006 Viton, 90 Duro O-Ring	1	
-13	PRS 7-14-12	Spring	1	
-4	PRS 7-14-4	Pin	1	

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable on Code
		1 2 3 4		
8-4	PRS-21-7	. . . Top-Off Adapter Overhaul Kit	1	
3	PRS-21-7-3	. . O-Ring	2	
5	PRS-21-7-5	. . Snap Ring	1	
6	PRS-21-7-6	. . O-Ring	1	
2	PRS-21-7-2	Backup Ring	2	

NUMERICAL INDEX

PART NUMBER	FIGURES	SM&R CODE
PRS 1586AS401-1	8-1	PEODP
PRS-1	8-1-01	XBGZZ
PRS-1-1	8-1-02	XBGZZ
PRS-1-2	8-1-24	PAOZZ
PRS-1-3	8-1-25	PAOZZ
PRS-2	8-2-11	PAGZZ
PRS-3	8-2-15	PAGZZ
PRS-5	8-2-07	PAGZZ
PRS-6	8-2-09	PAGZZ
PRS-6-1	8-2-09A	PAOZZ
PRS-7 1586AS401-4	8-2-03 8-3	PAOGG
PRS-7-1	8-3-1	PAGZZ

PART NUMBER	FIGURES	SM&R CODE
PRS-7-2	8-3-2	XAGZZ
PRS-7-3	8-3-3	XAGZZ
PRS-7-4	8-3-4	XAGZZ
PRS-7-5	8-3-5	XAGZZ
PRS-7-6	8-3-6	XAGZZ
PRS-7-9	8-3-9	XAGZZ
PRS-7-10#	8-3-10	XAGZZ
PRS-7-11#	8-3-11	XAGZZ
PRS-7-12#	8-3-12	XAGZZ
PRS-7-13	8-3-13	XAGZZ
PRS-7-14	8-3	PAGZZ
PRS-7-14-1	Overhaul Kit	KFGZZ
PRS-7-14-10	8-3-10	KFGZZ
PRS-7-14-11	8-3-11	KFGZZ
PRS-7-14-12	8-3-12	KFGZZ
PRS-8	8-2-05	PAGZZ
PRS-9	8-2-13	PAGZZ
PRS-10	8-2-16	PAGZZ
PRS-11	8-2-17	PAGZZ
PRS-12	8-2-12	PAGZZ
PRS-13	8-1-20	PAOZZ
PRS-14	8-2-04	PAGZZ
PRS-15	8-2-06	PAGZZ
PRS-16	8-2-10	PAGZZ
PRS-17	8-1-22	PAGZZ

PART NUMBER	FIGURES	SM&R CODE
PRS-18	8-2-18	PAOZZ
PRS-19	8-2-19	XAGZZ
PRS-20	8-1-23	PAOZZ
PRS-21 1586AS401-3	8-2-14	PAOGG
PRS-21-1	8-4-1	XAGZZ
PRS-21-2*	8-4-2	KFGZZ
PRS-21-3*	8-4-3	KFGZZ
PRS-21-4	8-4-4	XAGZZ
PRS-21-5*	8-4-5	KFGZZ
PRS-21-6*	8-4-6	KFGZZ
PRS-21-7	Overhaul Kit	PAGZZ
PRS-21-7-2	8-4	XAGZZ
PRS-21-7-3	8-4	XAGZZ
PRS-21-7-5	8-4	XAGZZ
PRS-21-7-6	8-4	XAGZZ
PRS-24	8-1-21	PAOGD
PRS-25	8-2-08	PAGZZ
PRS-26	8-1-26	XBGZZ
PRS-27 1586AS401-2	8-2	XAZZZ
PRS-28	8-1-27	PAGZZ
PRS-29	8-1-28	PAGZZ

* Part of PN PRS-21-7, Top-Off Adaptor Overhaul Kit

Part of PN PRS-7-14, Toggle Fill Valve Overhaul Kit

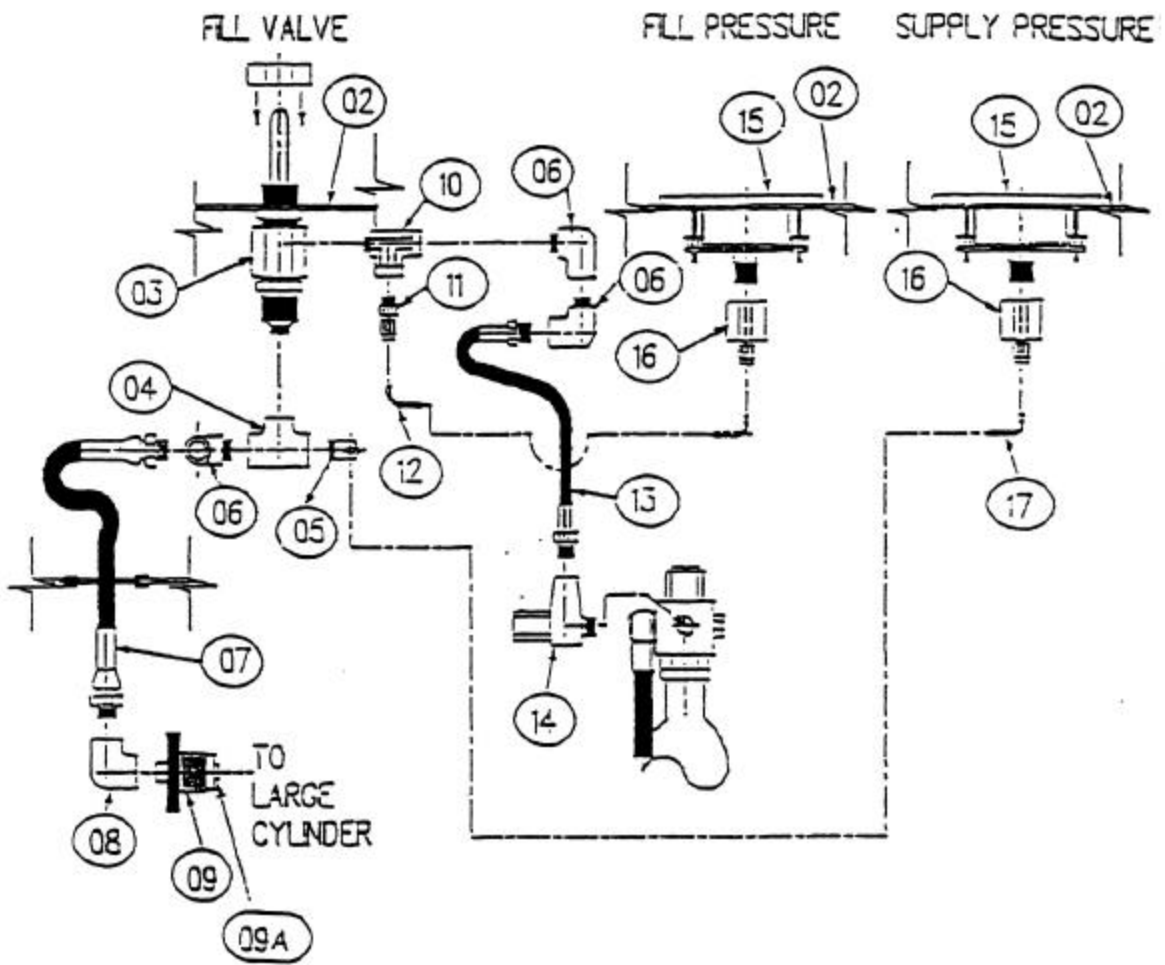


Figure 8-2 Portable Refill System - Exploded View

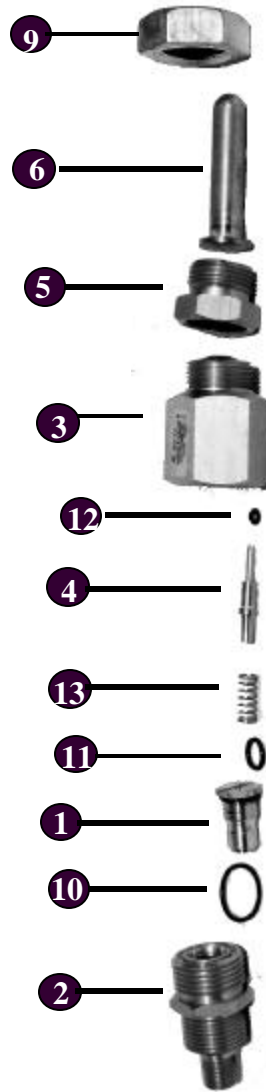
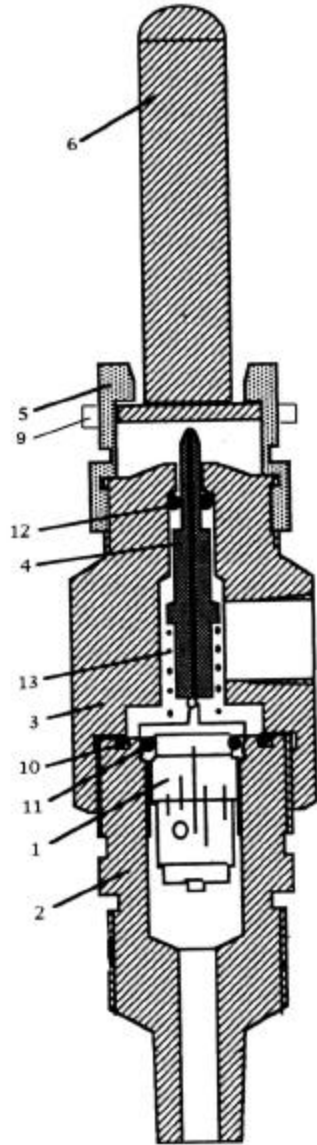


Figure 8-3. Toggle Fill Valve Model PRS-7
Sub-Assembly 1586AS401-4

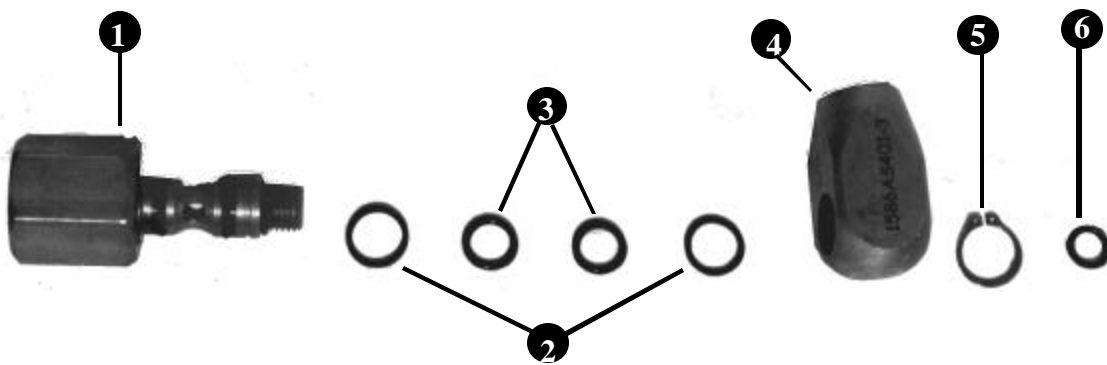


Figure 8-4. Top-Off Adapter PRS-21
Sub-Assembly 1586AS401-3